

**REMARKS**

This amendment is submitted in response to the Final Office Action mailed on June 15, 2006 in which claims 1-20 were rejected. With this Amendment, claims 1, 8, and 14 are amended. Accordingly, claims 1-20 are presented for reconsideration and allowance.

I. **Response to Obviousness Rejections of Claims 1-7**

Independent claim 1 was rejected under 35 U.S.C. § 103(a) as being obvious over Crump, U.S. Patent No. 5,340,433 ("the Crump patent") in view of Tan, U.S. Patent No. 5,142,211 ("the Tan patent"). The Office Action stated that the Tan patent discloses "a partition for maintaining physical and thermal separation between chamber and gantry", which when combined with the disclosure in the Crump patent, would render claim 1 obvious. The "partition" relied upon in the Tan patent is belt 36 (shown below in FIG. 1 of the Tan patent), which is used to prevent the escape of dust or other materials (the Tan patent, col. 3, lines 62-65). The Tan patent also discloses the use of belt 62, which extends perpendicular to belt 36 to cover the opening within belt 36 (i.e., slot 65) (the Tan patent, col. 5, lines 7-19).

In order to reject a claim under 35 U.S.C. § 103(a), all of the claim limitations must be taught or suggested by the prior art. *See* M.P.E.P. 2143.03, citing *In re Royka*, 180 U.S.P.Q. (BNA) 580 (C.C.P.A. 1974). As amended, claim 1 requires maintaining physical and thermal separation between the heated build chamber and a gantry that controls motion of the dispensing head with at least first and second deformable thermal insulators, compressing or expanding the first deformable thermal insulator based on the movements of the dispensing head in a first direction, and compressing or expanding the second deformable thermal insulator based on the movements of the dispensing head in a second direction that is orthogonal to the first direction.

As discussed in the present application, x-y gantry 18 is separated from build chamber 24 with x-baffles 132 and y-baffles 136, which are deformable thermal insulators (present application, page 11, lines 10-13). Extrusion head 14 moves back and forth along the x-axis with the use of bridge 65, which compresses and expands x-baffles 132 (present application, page 10, lines 13-15; and page 11, lines 22-25). Similarly, extrusion head 14 moves back and forth along the y-axis (i.e., orthogonal to the x-axis) with the use of carriage 72, which compresses and expands y-baffles 136 (present application, page 10, lines 15-18;

and page 11, lines 22-26). This allows x-baffles 132 and y-baffles 136 to function as an insulating ceiling for build chamber 24 that compresses and expands along the x-axis and y-axis based on the movement of extrusion head 14.

In contrast, belts 36 and 62 disclosed in the Tan patent do not compress or expand with the movement of carriage subassembly 40. Belt 36 moves along the Z-axis by wrapping around and unwrapping from belt rollers 37a and 37b (the Tan patent, col. 3, lines 62-68, and col. 6, lines 57-62). For example, as shown in FIG. 1 of the Tan patent, when carriage subassembly 40 moves along the z-axis toward side member 12, belt 36 unwraps from belt roller 37a and wraps around belt roller 37b, thereby allowing belt 36 to follow the movement of carriage subassembly 40. As such, belt 36 requires the use of belt rollers 37a and 37b, and does not compress or expand based on the movement of carriage subassembly 40.

Similarly, belt 62 moves along the x-axis by wrapping around and unwrapping from belt rollers 63 and 64 (the Tan patent, col. 5, lines 7-19, and col. 7, lines 5-8). As such, belt 62 requires the use of belt rollers 63 and 64, and does not compress or expand based on the movement of carriage subassembly 40. Accordingly, the Tan patent does not teach, disclose, or suggest compressing or expanding a first deformable thermal insulator based on the movements of a dispensing head in a first direction, and compressing or expanding a second deformable thermal insulator based on the movements of a dispensing head in a second direction that is orthogonal to the first direction.

Furthermore, the Crump patent does not disclose, teach, or suggest maintaining physical and thermal separation between the heated build chamber and a gantry that controls motion of the dispensing head with at least first and second deformable thermal insulators. Thus, the Tan patent and the Crump patent, taken alone or in combination, do not disclose all of the limitations of claim 1. As a result, claim 1 is patentable over the Crump patent in view of the Tan patent.

Claims 2-7 depend from claim 1, and are allowable therewith. In addition, it is respectfully submitted that the combinations of features recited in claims 2-7 are independently patentable, although this does not need to be specifically addressed herein since any claim depending from a patentable independent claim is also patentable. See M.P.E.P. 2143.03, citing In re Fine, 5 U.S.P.Q.2d (BNA) 1596 (Fed. Cir. 1988).

## II. Response to Obviousness Rejections of Claims 8-20

Independent claim 8 was rejected under 35 U.S.C. § 103(a) as being obvious over the Crump patent in view of the Tan patent and Anderson, U.S. Patent No. 3,494,853 ("the Anderson patent"). In order to reject a claim under 35 U.S.C. § 103(a), all of the claim limitations must be taught or suggested by the prior art. See M.P.E.P. 2143.03, citing *In re Royka*, 180 U.S.P.Q. (BNA) 580 (C.C.P.A. 1974).

As amended, claim 8 requires maintaining thermal isolation between the external motion control components and the build chamber with at least first and second deformable thermal insulators, compressing or expanding the first deformable thermal insulator based on the movements of the dispensing head in a first direction, and compressing or expanding the second deformable thermal insulator based on the movements of the dispensing head in a second direction that is orthogonal to the first direction.

As amended, claim 20 requires motion control components (for controlling the motion of the dispensing head and the base) that are located external to and in thermal isolation from the build chamber by at least first and second deformable thermal insulators, where the first deformable thermal insulator is compressed or expanded when the dispensing head is moved in a first direction, and the second deformable thermal insulator is compressed or expanded when the dispensing head is moved in a second direction that is orthogonal of the first direction.

As discussed above for claim 1, the Crump patent and the Tan patent do not teach, disclose, or suggest compressing or expanding a first deformable thermal insulator based on the movements of a dispensing head in a first direction, and compressing or expanding a second deformable thermal insulator based on the movements of a dispensing head in a second direction that is orthogonal to the first direction.

Furthermore, the Anderson patent does not teach, disclose, or suggest compressing or expanding a first deformable thermal insulator based on the movements of a dispensing head in a first direction, and compressing or expanding a second deformable thermal insulator based on the movements of a dispensing head in a second direction that is orthogonal to the first direction, as required by claims 8 and 14.

The Anderson patent is directed to a physical vapor deposition system (e.g., a sputtering system), which involves generating a plasma between a cathode and an anode for

depositing ionized gas particles onto a substrate (the Anderson patent, col. 5, lines 3-32). The system includes a substrate support that is movable along or in X-Y-Z planes for retaining the substrate (the Anderson patent, col. 6, lines 42-49). As shown, the substrate support includes bellows 56, which are flexible locks extending around support legs 52-54 for protecting the atmosphere within the sputtering chamber (the Anderson patent, col. 6, lines 53-63).

However, the movable substrate is not a gantry system that controls motion of a dispensing head. Moreover, bellows 56 do not compress or expand based on the movements of a dispensing head in orthogonal directions, or any benefits of such actions. Thus, the Crump patent, the Tan patent, and the Anderson patent, taken alone or in combination, do not disclose all of the limitations of claims 8 or 14. As a result, claims 8 and 14 are patentable over the Crump patent in view of the Tan patent and the Anderson patent.

Claims 9-13 and 15-20 depend from claims 8 and 14, respectively, and are allowable therewith. In addition, it is respectfully submitted that the combinations of features recited in claims 9-13 and 15-20 are independently patentable, although this does not need to be specifically addressed herein since any claim depending from a patentable independent claim is also patentable. See M.P.E.P. 2143.03, citing In re Fine, 5 U.S.P.Q.2d (BNA) 1596 (Fed. Cir. 1988).

### CONCLUSION

Because the prior art made of record does not show, suggest, or teach all the limitations in claims 1-20, pending claims 1-20 are in condition for allowance. Favorable reconsideration and allowance of this application are respectfully requested.

The Commissioner is authorized to charge any additional fees associated with this paper or credit any overpayment to Deposit Account No. 11-0982.

Respectfully submitted,  
KINNEY & LANGE, P.A.

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By: B. R. Morrison  
Brian R. Morrison, Reg. No. 58,455  
THE KINNEY & LANGE BUILDING  
312 South Third Street  
Minneapolis, MN 55415-1002  
Telephone: (612) 339-1863  
Fax: (612) 339-6580